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WRISTWATCH WITH REMOVABLE FACE

BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

[0001] This invention is in the field of wristwatches and more particularly wristwatches with removable watch faces.

PRIOR ART

[0002] It is known that wristwatches are one of the most commonly used devices in the world, and it is further known that for many persons a wristwatch is not only a timepiece but also is an accessory of dress and even a fashion statement. In the latter regard, it is desirable not only that a wristwatch be highly attractive, but also be one that coordinates or harmonizes with the other articles of dress, such as a person's suit, shirt or jewelry.

[0003] While some persons wear the same watch for all occasions and with all different attire, either because they cannot afford additional watches or because the dress coordination issue is not important to them, for others, one particular watch cannot possibly be acceptable for numerous different styles and levels of dress, from casual dress to business dress to formal dress, and furthermore, one watch is not likely to match particularly well with many different outfits within one of these dress categories.

[0004] The obvious solution, if one has the means, is to purchase numerous different watches for the different situations. Notwithstanding the differences in watches based on quality and design of the watch movement and of the casing and bracelet, the appearance of the watch face itself often has the most immediate visual impact.

[0005] This has led some innovators to make a watch changeable in appearance by having interchangeable watch faces. Numerous prior art patents, namely U.S. Patent Nos. 4,660,992 to Paul et al., 4,796,240 to Stevens, 5,008,869 to Dweck, 5,018,118 to Ross, 5,168,479 to Lima, 5,787,055 to Alpert, 5,793,710

to Jacobi, and 6,118,735 to Li disclose watches with removable watch faces. One common feature and drawback with these prior art watches, is that when the watch housing is opened to allow access to the watch face, the hour, minute and second hands become exposed, and since they are very fragile there is a great likelihood that they will be damaged by anyone who is not a professional watchmaker working in a controlled environment. Thus, this kind of interchangeable watch face is not suitable for consumers to change a watch face by themselves.

[0006] In the above-listed prior art is an alternate approach for interchangeable watch faces, namely, to provide an opening in the form of a slit in the side wall of the watch casing, so that a watch face can be slid out of the casing through the slit, and a replacement watch face slid into the casing via the slit. Here, the watch face would be positioned parallel to and below the plane of the hands. In this kind of arrangement, there is typically a drive shaft extending from the watch movement perpendicularly upward to and fixedly connected to the hands. This drive shaft is usually a series of three concentric tubes which are very tiny in nature. In order to use a replaceable watch face that slides in from the side, such watch face needs to have a notch extending from a peripheral edge radially inward to the center, so that the watch face can be positioned to have the notch straddle the drive shaft as it is slid into place, as seen in prior art patents, U.S. No. 4,660,992, No. 5,793,710, and No. 6,118,735.

[0007] A still further variation in structure is seen in U.S. No. 5,751,667 to Nunes, where there is an outer crystal and an inner transparent panel below the hands; however, these transparent elements are separable to gain access to the chamber below to change the golf tees or other graphic display articles, so that the hands become exposed to damage.

[0008] The present invention seeks to provide an alternative solution to the problem of establishing different appearances for a single wristwatch in a simple, convenient, inexpensive manner which is also safe from risk and damage to the hands of the watch.

SUMMARY OF THE INVENTION

[0009] It is a first object of this invention to provide a wristwatch wherein the owner of a watch can alter the basic appearance of the watch by altering the watch face in a manner which does not risk damage to the hands.

[0010] It is a further object to provide a wristwatch where a watch face is removable, and new watch faces are replaceable in a position below the hands but visible through the transparent crystal while the hands remain protected.

[0011] It is a still further object to provide a wristwatch with a removable watch face where the hands are protected by encasing the hands between a sandwich of outer transparent crystal and inner crystal above and below the hands, respectively, where said outer and inner transparent panes are secured together by an outer perimeter casing, thus forming an integral unit or cartridge. In a preferred embodiment, this casing has screw threads on the bottom outer periphery or elsewhere for engagement with mating screw threads in a casing of such wristwatch, which casing includes therein the watch movement or drive mechanism, which is typically an electric motor with an output drive mechanism.

[0012] It is an additional object of this invention of providing a wristwatch with a removable watch face where the hands are within a removable cartridge or upper housing that includes an outer transparent crystal and an inner transparent pane, with the hands secured and protected between these two transparent elements.

[0013] It is a further object to provide a wristwatch with a removable watch face where the casing, which contains the movement, includes at its top a recess to receive the watch face and to receive and hold the cartridge containing the hands and crystal, and to allow coupling of the drive shafts fixed to the hands with the movement in the casing.

[0014] Since the casing which contains the watch movement includes a laterally extending adjustment stem, the cartridge containing the hands and the outer crystal and inner glass can be attached to the housing by merely rotating it in the recess until the mating threads engage and become secured to each other.

The rotation causes no interference of any parts because the drive stems simply engage with the drive shaft from the movement and are free to rotate in the lower transparent pane of the cartridge. Thereafter, the time is set by the adjustment knob.

[0015] Other objects and advantages of this invention will become apparent from the following description taken in conjunction with the accompanying drawings wherein are set forth, by way of illustration and example, certain embodiments of this invention.

[0016] The drawings constitute a part of this specification and include exemplary embodiments of the present invention and illustrate various objects and features thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] Fig. 1 is an exploded perspective view shown schematically of the new wristwatch of this invention,

[0018] Fig. 2 is a top plan view thereof,

[0019] Fig. 3 is an exploded view in section taken along lines 3-3 in Fig. 2,

[0020] Fig. 4 is a top plan view of a second embodiment of the new wristwatch,

[0021] Fig. 5 is an exploded view in section taken along lines 5-5 in Fig. 4, and

[0022] Fig. 6 is an exploded perspective view similar to Fig. 5 of a third embodiment of the new wristwatch with an electroluminescent display.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0023] Fig. 1 is a schematic drawing showing an exploded perspective view of the new wristwatch 10 of the present invention. The three basic components of this wristwatch are the casing 12, the upper housing 14 and the replaceable watch face 16. Figs. 2, 3 and 4 show the casing 12 and upper housing in greater detail.

[0024] The casing 12 has a bottom formed by panel 18, a top part 20 including a top panel 20A, peripheral side walls 22 with a first chamber 26 defined between said top and bottom panels and said side walls. It is preferable that the

casing walls define a circular cylinder with internal threads 28 on the inside wall surfaces above said top panel 20A; however, the casing outer walls may take a variety of other shapes, which are not necessarily round.

[0025] Within chamber 26 is mounted a watch movement 32 well known in the prior art which includes a motor and a replaceable battery (not shown), drive means 34 and an adjustment shaft 36 and knob 38 situated external of the side walls. The drive means includes at least two and usually three rotatable elements for rotating hour, minute and second hands respectively, such drive means also being well known in the prior art. The casing also includes typical shelf-like projections 41 on opposite ends thereof connectible to opposite ends of a wristband or bracelet.

[0026] The replaceable watch face 16 is situated atop the top panel 20A of the casing 12 with means to be described later for positioning and maintaining this or any replacement watch face in the predetermined orientation relative to the casing, to coordinate with the time indicating hands.

[0027] The upper housing 14 is formed as a removable self-contained integral unit or cartridge which can be screwed into the casing or unscrewed and removed to allow replacement of the watch face with an alternate watch face. This cartridge is formed of a transparent crystal 42 at the top, a transparent base 44 at the bottom, and side walls formed by a cylindrical rim 46 which maintains said crystal and base spaced apart to define a second chamber 48 which surrounds and protects the time indicating hands 50, 51 and 52. Situated at the center of the transparent base 44 is a bushing 54 and drive shaft means 56 comprising three concentric shafts 57, 58 and 59 corresponding and fixed to said hands 50, 51 and 52 respectively. This bushing is fixed axially in base 44 and allows the shafts 57, 58 and 59 to rotate freely therein. The shafts are typically outer and inner concentric tubes and a solid rod or additional concentric tube within said inner tube. The bottom ends of these shafts are releasably coupled to the drive elements of the drive means of the movement.

[0028] In some embodiments the drive means may extend upward above the top panel 20A; alternatively the drive means remains below 20A. At the bottom outside peripheral surface of the rim 46 are external threads 64 for threaded engagement with internal threads 66 in said casing when the upper housing 14 is joined to the casing 12 with the watch face 16 captured between them. Other coupling means without screw threads are possible for releasably securing the upper housing to the casing below.

[0029] As is evident, the watch face 16, selected by the user, is clearly visible through the crystal 42 and base 44. Because the upper housing 14 is so easily separable from the casing, watch faces can be frequently and easily interchanged. Whenever a replacement watch face is installed, its proper orientation is automatically established and maintained by notch 68 cut in a peripheral edge of the watch face engaging a projection 70 on the top surface of panel 20A the casing. Numerous other positioning means are readily possible, including a projection from the watch face into a recess in the casing, or guide surfaces of the watch face and the casing.

[0030] The transparent crystal and base of the upper housing 14 may be made of glass or plastic, and the rim or side walls 46 that maintain the crystal and base apart may be preferably metal or plastic or other material. Also, the crystal and/or the base may be configured such that their mutual peripheral edges are joined without need between them of a separate side wall or cylindrical rim component.

[0031] With the structure as disclosed above, the upper housing 14 is a fixed unit of transparent crystal, transparent base, rim, if utilized, hands and drive shafts. The hands are fully protected from contact with a person's fingers, or with the replaceable watch face or with anything. The routine for removing a watch face and substituting a new watch face is extremely simple, quick and failsafe. Obviously, there is no limit to the number of different watch faces a user can acquire and use. Furthermore, a user can easily make and/or design his or her own watch faces and graphics thereon.

[0032] Figs. 4 and 5 illustrate a further embodiment of this invention which has many similarities to the wristwatch of Figs. 1-3 and use the same reference numbers for components which are the same as those in Figs. 1-3. The principal difference is that instead of a removable watch face 16 being in the form of a thin sheet situated in a thin space above panel 20A and below lower transparent base 44 in Figs 1-3, the changeable visual effect seen in Figs. 4 and 5 is achieved by movable articles 72 such as tiny balls or other miniature ornamental articles dimensioned to be freely movable in space 74 above panel 20A and below transparent base 44. In this further embodiment, the visual effect of the watch face is not only changeable by substituting different movable articles while the hands remain fully protected, but the visual appearance is changeable merely by movement of the articles. Also, one could utilize both a substitute watch face and substitute movable articles within space 74 while the wristwatch is being worn.

[0033] Fig. 6 shows a further embodiment of the new wristwatch, this drawing being similar to Fig. 1 and for convenience of description, having the same reference numbers for similar or identical components. The relevant difference is that the watch face 16A is an electroluminescent display ("ELD"), the technology of which is known the prior art, examples being products from (a) epartyunlimited.com at www.gotglow.com, (b) MX5Parts.co.uk at www.MX5Parts.co.uk, (c) rident Display Products at www.tridentdisplays.co.uk, and (d) All Electronics Corp., Van Nuys, CA.

[0034] The watch face 16A using luminescent display technology provides a prescribed illuminated visual image which may change pursuant to a program or by manual control. Since the displays available in the watch face are limited to the original programming, this ELD watch face may be replaced by others with different displays, by simply separating the upper housing 14 from the lower housing or casing 12 as described earlier and substituting a different ELD watch face.

[0035] When the ELD watch face is installed its electrical contacts 16B become electrically connected to contacts 16C in the bottom of casing 12. To

activate or control this ELD watch face, there are one or more control buttons 16D and 16E for on/off control and for selecting display programs. Drive and programming circuitry are included either on the ELD panel or in the casing.

[0036] It is to be understood that while certain forms of the present invention have been illustrated and described herein, it is not to be limited to the specific forms or arrangement of parts described and shown.